REMARKS

This application has been reviewed in light of the Office Action dated May 22, 2001. Claims 1-11 remain pending in this application, and are considered patentable without further amendment for the reasons set out below. Favorable reconsideration is requested.

Claims 1-4 are the independent claims.

In the Office Action, Claims 1-11 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,008,502 (*Deguchi et al.*) in view of U.S. Patent No. 6,231,413 (*Tsukamoto*).

Independent Claim 1 is directed to a manufacturing method of an electron-emitting device. The method comprises the steps of disposing an electrically conductive member having a gap on a substrate, and applying a voltage to the electrically conductive member while irradiating at least the gap with an electron beam from an electron emitting means disposed apart from the electrically conductive member in an atmosphere comprising a carbon compound.

With regard to the *Deguchi* and *Tsukamoto* references, the Office Action alleges that *Deguchi et al.* teaches the foregoing features of Claim 1 at col. 11, lines 8-12, but makes no mention whatsoever as to how *Tsukamoto* has been applied against Claim 1 (and against Claims 2-7, 9 and 10). Nonetheless, Applicants have carefully reviewed both *Deguchi* and *Tsukamoto*, and respectfully submit that Claim 1 is clearly patentable over those references for the following reasons.

The portion of *Deguchi* relied on in the Office Action refers merely to a method for producing an electron emitting device formed using a diamond layer. The method includes a step of irradiating a predetermined region of the diamond layer with ultraviolet rays of a wavelength of 200 nm or less, and apparently makes it possible to selectively remove elements

bonded to the diamond surface and form new bonds. As a result, a state of electron affinity on the diamond surface can be controlled to be either positive (insulating) or negative (conductive) (see, e.g., col. 11, lines 8-17). *Deguchi* also refers to a step of applying a voltage across two electrodes 21a and 21b of an electron emitting device (see, e.g., col. 6, lines 3-8). However, that voltage is applied for driving the device after it has been already manufactured.

Applicants respectfully submit that, while *Deguchi* may refer to the foregoing features, nothing has been found, or pointed out, in *Deguchi et al.* that would teach or suggest a manufacturing method of an electron-emitting device, comprising a step of applying a voltage to an electrically conductive member of the device having a gap *while irradiating at least the gap of the conductive member with an electron beam* from an electron emitting means disposed apart from the electrically conductive member *in an atmosphere comprising a carbon compound*, as recited in Claim 1.

Tsukamoto is directed to an electron-emitting device which comprises a pair of electrodes and an electroconductive thin film therebetween having an electron-emitting region. The electroconductive thin film is coated with an additional film at the electron-emitting region to provide an additional resistance within a range from 500 Ω to 100 kΩ.

Since the Office Action did not point out how *Tsukamoto* is applied against Claim 1, and Applicants understand *Tsukamoto* as having similar deficiencies as *Deguchi* as a reference, that claim is considered patentable over *Deguchi* and *Tsukamoto* taken separately or together.

Independent Claim 2 recites features that are similar in many respects to those of Claim 1 emphasized above, and also is believed to be clearly patentable over *Deguchi* and *Tsukamoto* for the same reasons as those presented above.

Further, *Deguchi* fails to teach or suggest a special feature as defined in Claim 2 in the manufacturing method of the electron-emitting device, "applying a voltage to first and second electrically conductive members with a gap interposed while irradiating at least the gap with an electron beam in an atmosphere comprising a carbon compound.

Deguchi discloses "irradiating with an ultraviolet rays", however does not teach or suggest an equivalency of the ultraviolet ray to the electron beam irradiation as defined in Claims 1-4 of the present application. Further, it is to be noted that a purpose of the feature "irradiating an electron beam in the atmosphere comprising the carbon compound" as defined in Claims 1-4 is to "deposit a carbon film on the gap". While *Deguchi* does not teach or suggest such "irradiation of the electron beam in the atmosphere comprising carbon compound" and such purpose.

It is also to be noted that *Deguchi* does not teach or suggest "applying the voltage to the electrically conductive member while (during a period of) irradiating with the electron beam," contrary to the Office Action. According to *Deguchi*, referring to lines 19-27 in column 4, lines 43-47 in column 5 and lines 3-8 in column 6, for example, "applying bias" is conducted, "after" producing the electron-emitting device, to "driving" the electron-emitting device already produced, and is "not conducted during the manufacturing process" of the electron-emitting device.

For at least those reasons, Claim 2 is considered patentable over *Deguchi* and *Tsukamoto* token alone or in any combination.

Independent Claim 3 recites, in part:

"*irradiating at least said gap with an electron beam* from electron emitting means disposed apart from said electrically conductive member *in an atmosphere comprising a*

carbon compound within a period where a voltage is applied to said electrically conductive member." (Emphasis supplied).

For the reasons argued above, Applicants respectfully submit that nothing in either *Deguchi* or *Tsukamoto* would teach or suggest those features of Claim 3, and that Claim 3 is therefore patentable over those references, whether considered separately or in combination.

Independent Claim 4 recites features that are similar in many respects to those of Claim 3, and also is believed to be clearly patentable over *Deguchi* and *Tsukamoto* for the same reasons.

A review of the other art of record has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed to be patentable over the prior art of record.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed to be patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing remarks, Applicants respectfully request favorable

reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

Attorney for Applicants

Registration No. 25,823

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200

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